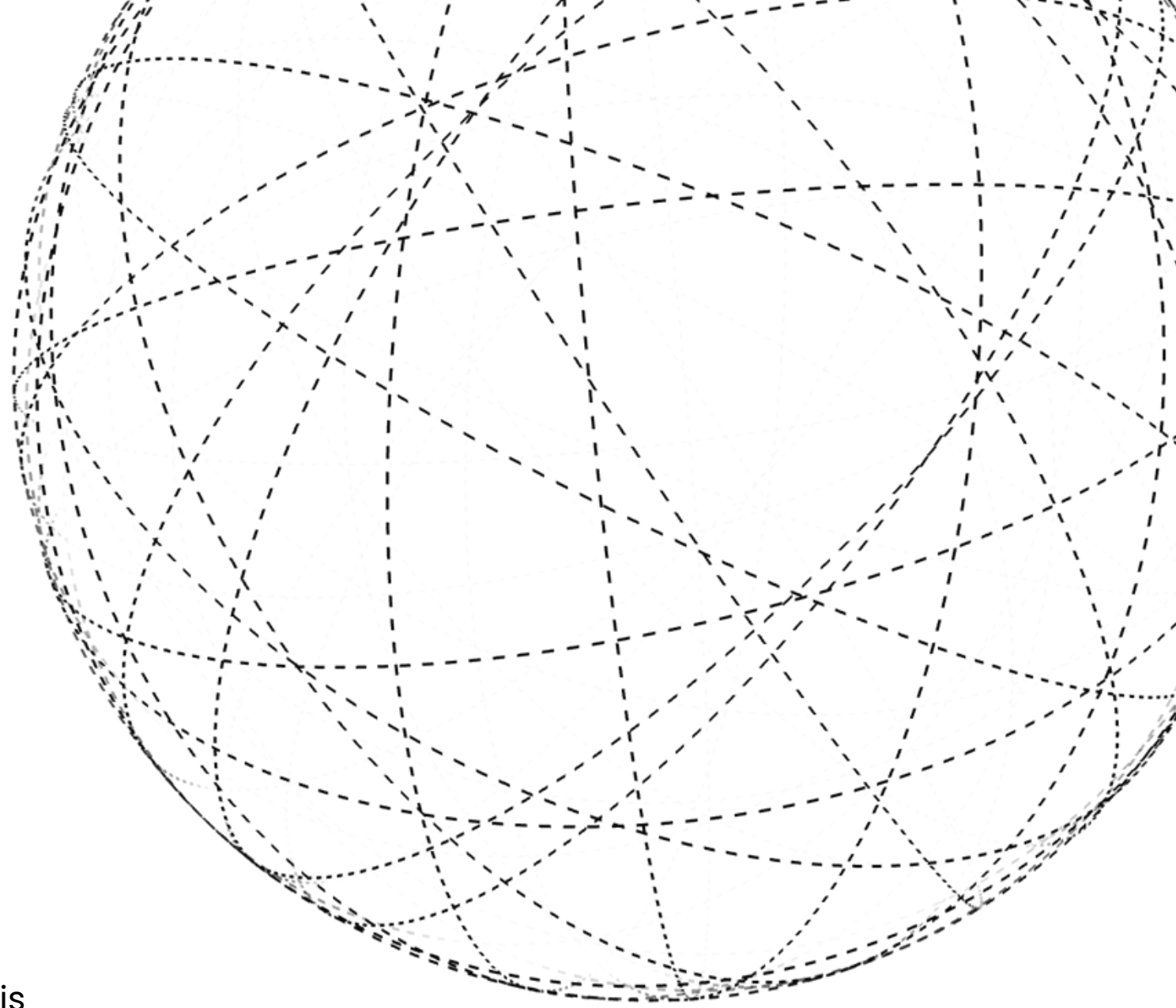


Object-Centric Process Mining

How to disentangle
Spaghetti processes?

Prof.dr.ir. Wil van der Aalst
RWTH Aachen University & Chief Scientist Celonis



Timeline of Process Mining: Research Turned into a new Product Category

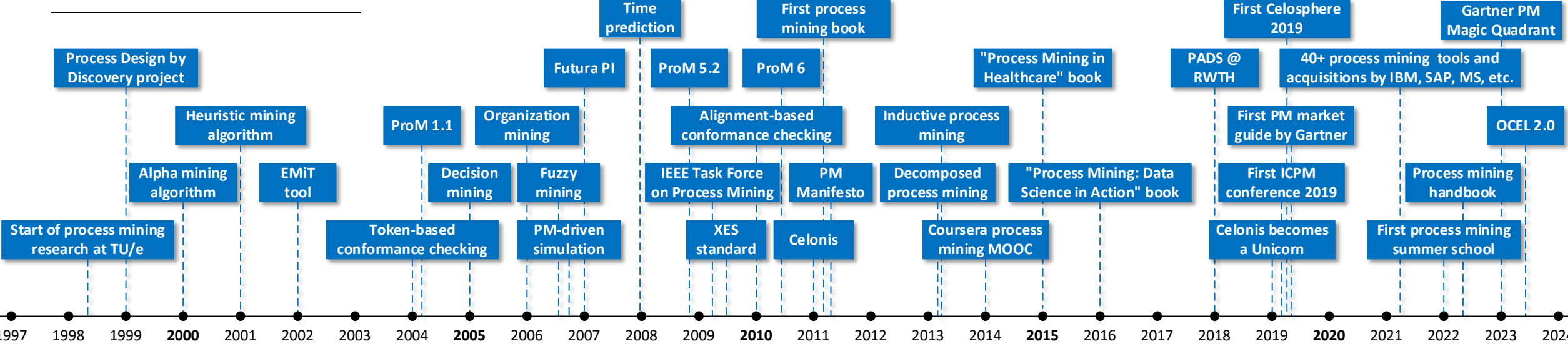


Initial steps with a focus on discovery

The golden age of process mining (adding conformance, time, data, organization, etc.)

Dissemination of knowledge and commercial software tools to make process mining accessible to all

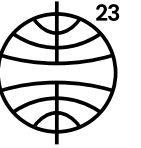
Increasing adoption, establishing a new scientific discipline & software category



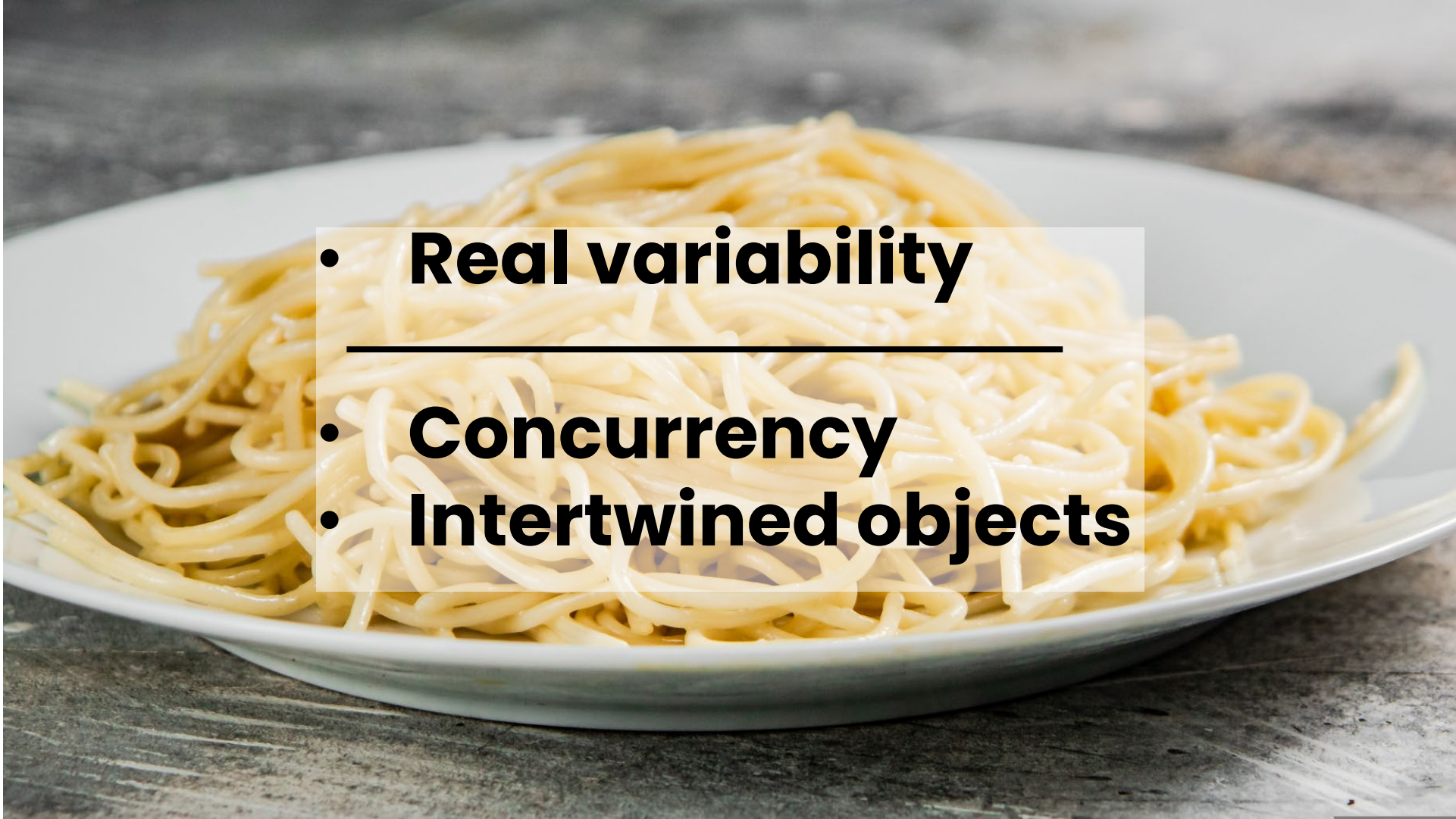
Process Discovery: What we expected ...



Process Discovery: What we typically get



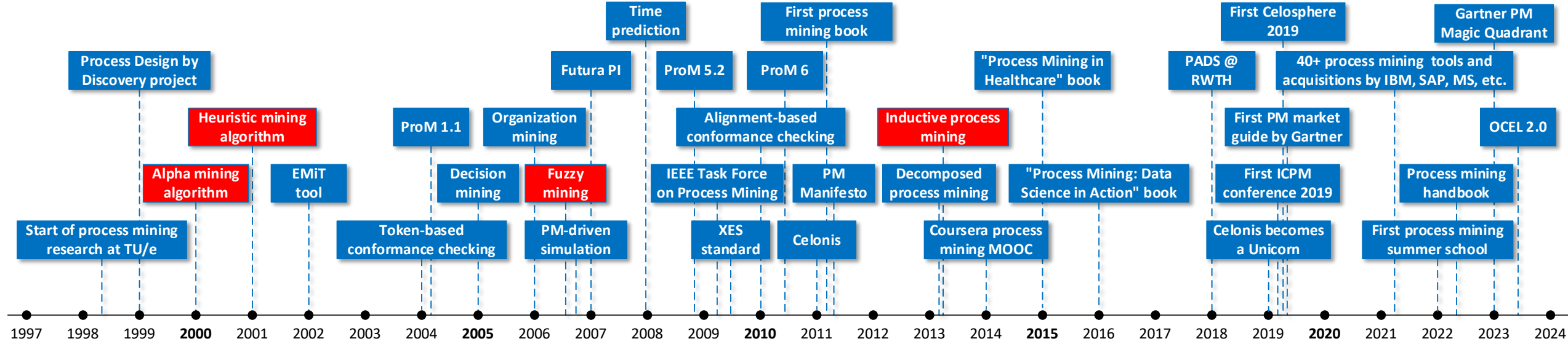
What is causing these Spaghetti processes?



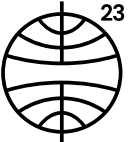
- **Real variability**

- **Concurrency**
- **Intertwined objects**

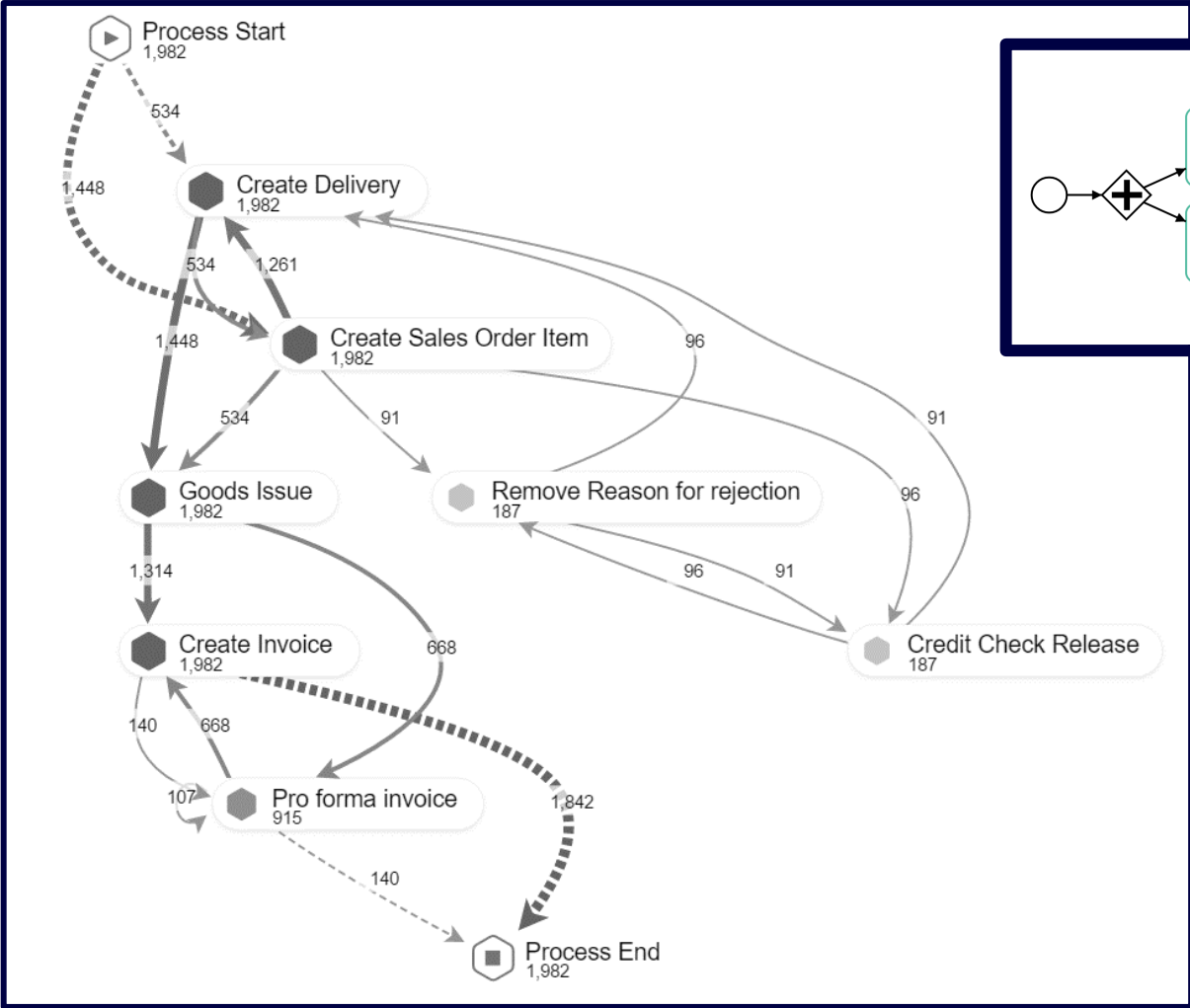
Since the beginning process mining research worked on techniques to discover models able to express concurrency



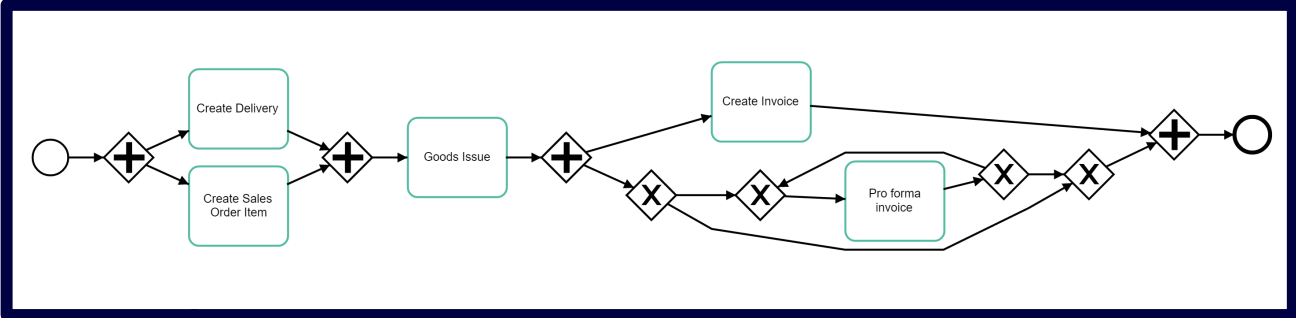
Concurrency matters!



DFGs cannot represent concurrency



IM discovers concurrency



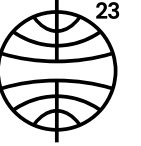
3,308

501 variants

both cover **60%** of the cases

Activities not executed in a fixed order create loops leading to Spaghetti-like underfitting models.

Concurrency tells only part of the story

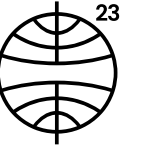
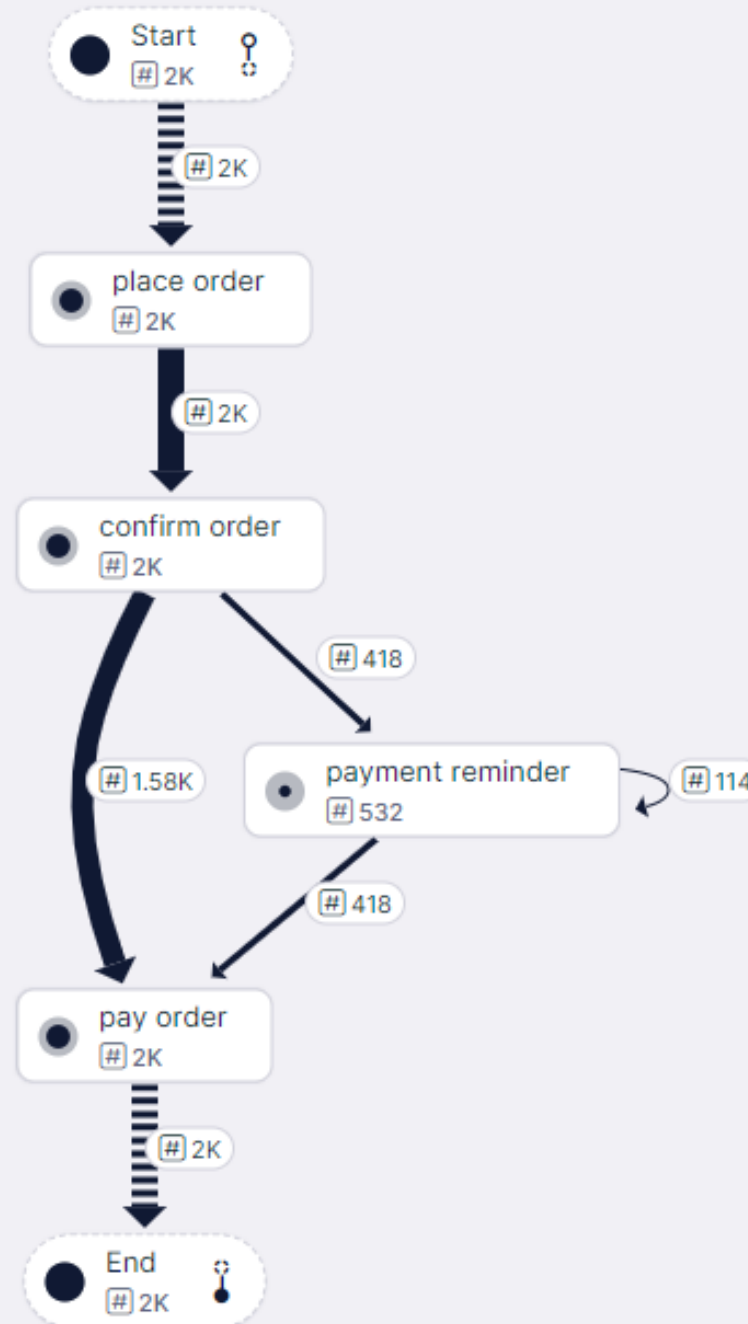


Example object types:

- Orders
- Items
- Packages
- Machines
- Employees
- Patients
- Customers
- Machines
- Containers
- Payments
- Vehicles
- Rooms
- Etc.

Just looking at orders

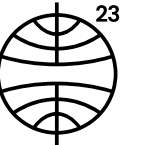
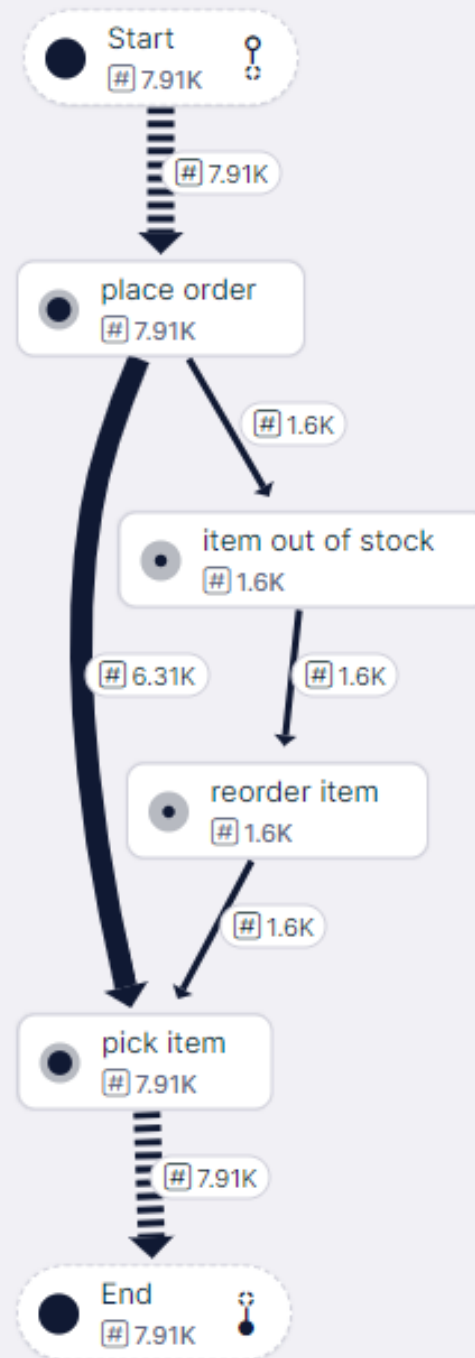
Only 6 variants!



2,000 orders
7,914 items

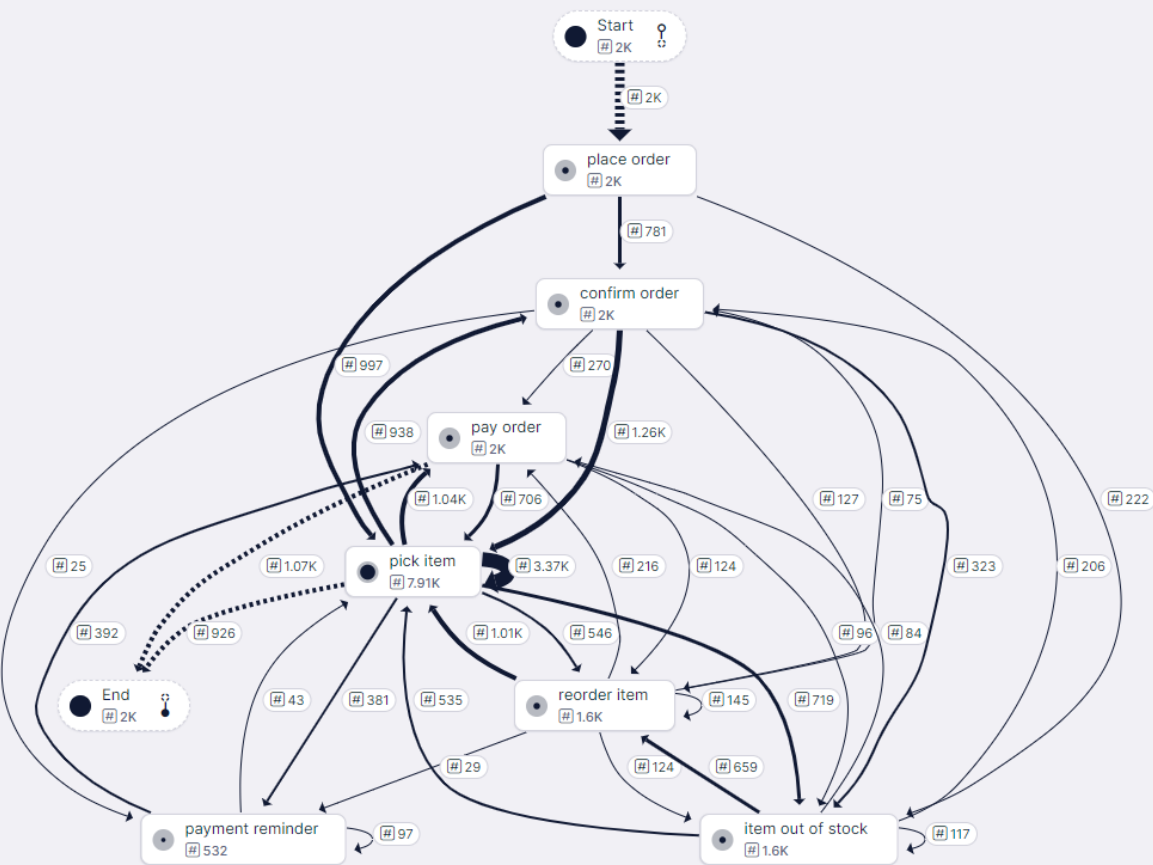
Just looking at items

Only 2 variants!

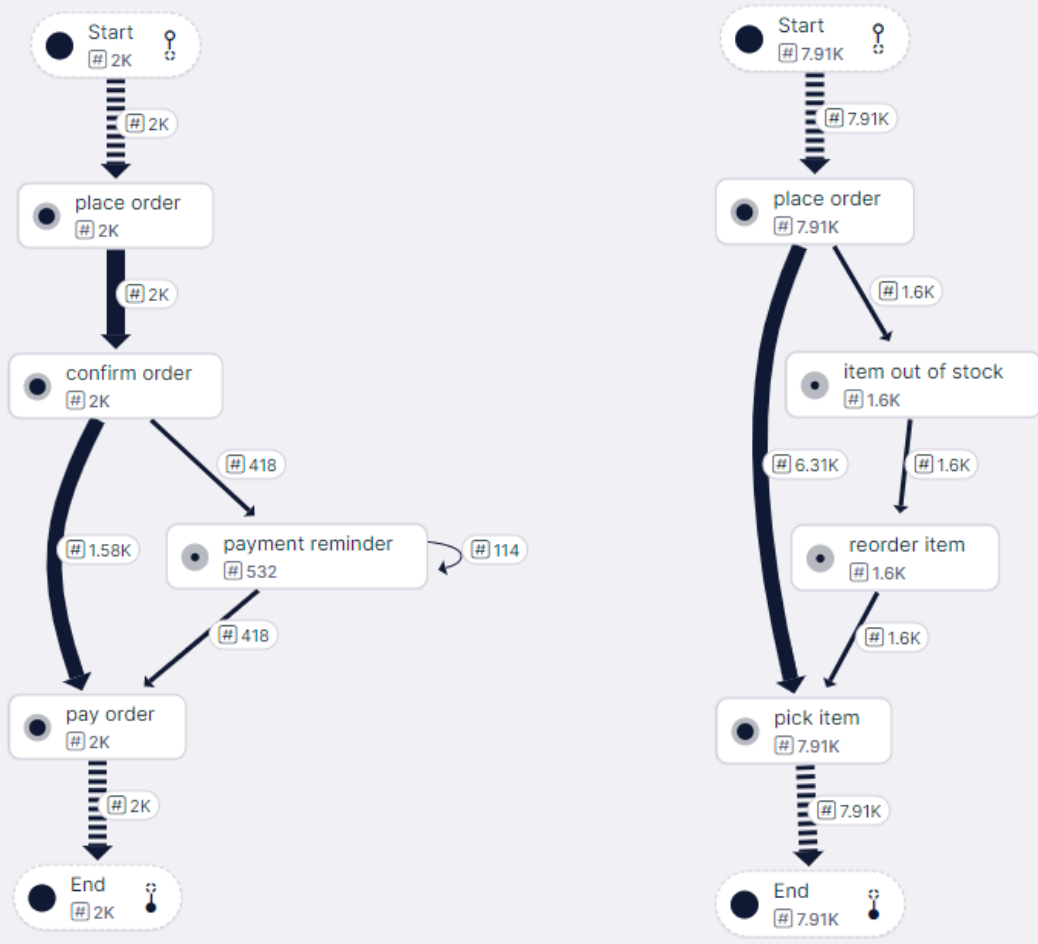
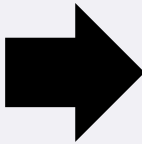


2,000 orders
7,914 items

Disentangling "Rainbow Spaghetti" processes helps!



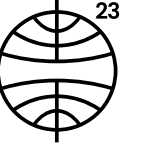
1,033 variants



6+2=8 variants

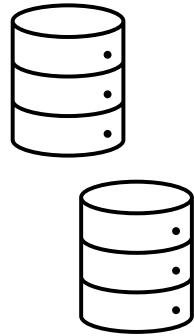
**We developed Object-Centric
Process Mining (OCPM) to
address these problems**

Benefits of using Object-Centric Process Mining (OCPM)



Avoid repeatedly going back to your source systems

(a system-agnostic single source of truth)



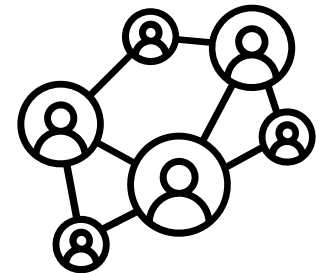
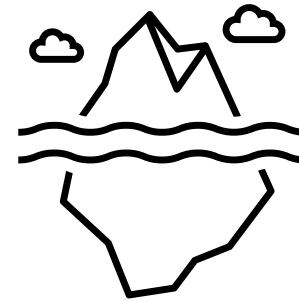
See and understand the interactions between different object types

(problems live at the intersections of processes and organizational entities)

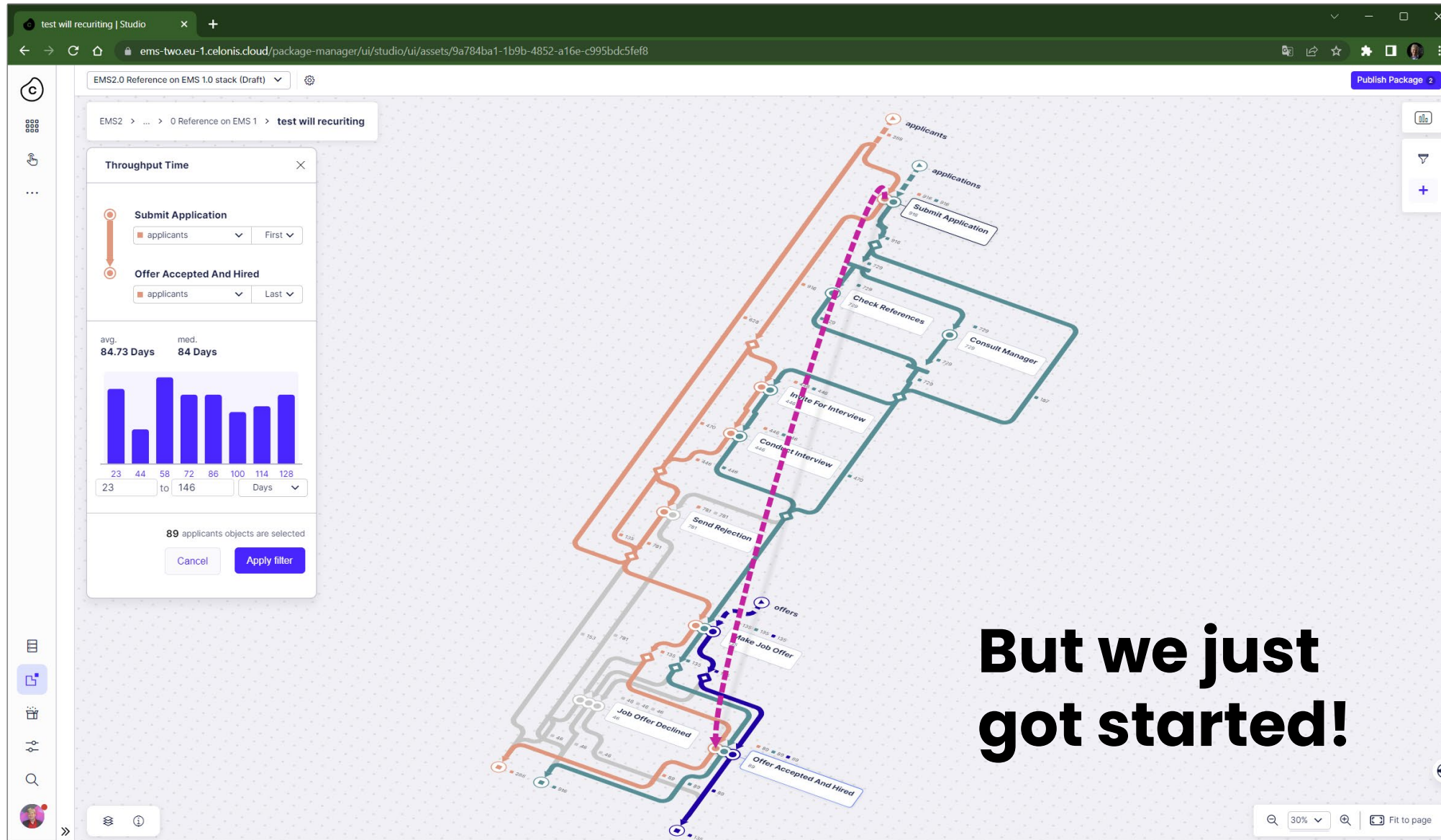
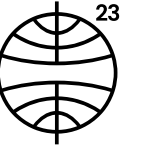


Avoid distortions due to the single-case assumption

(circumventing convergence and divergence problems)

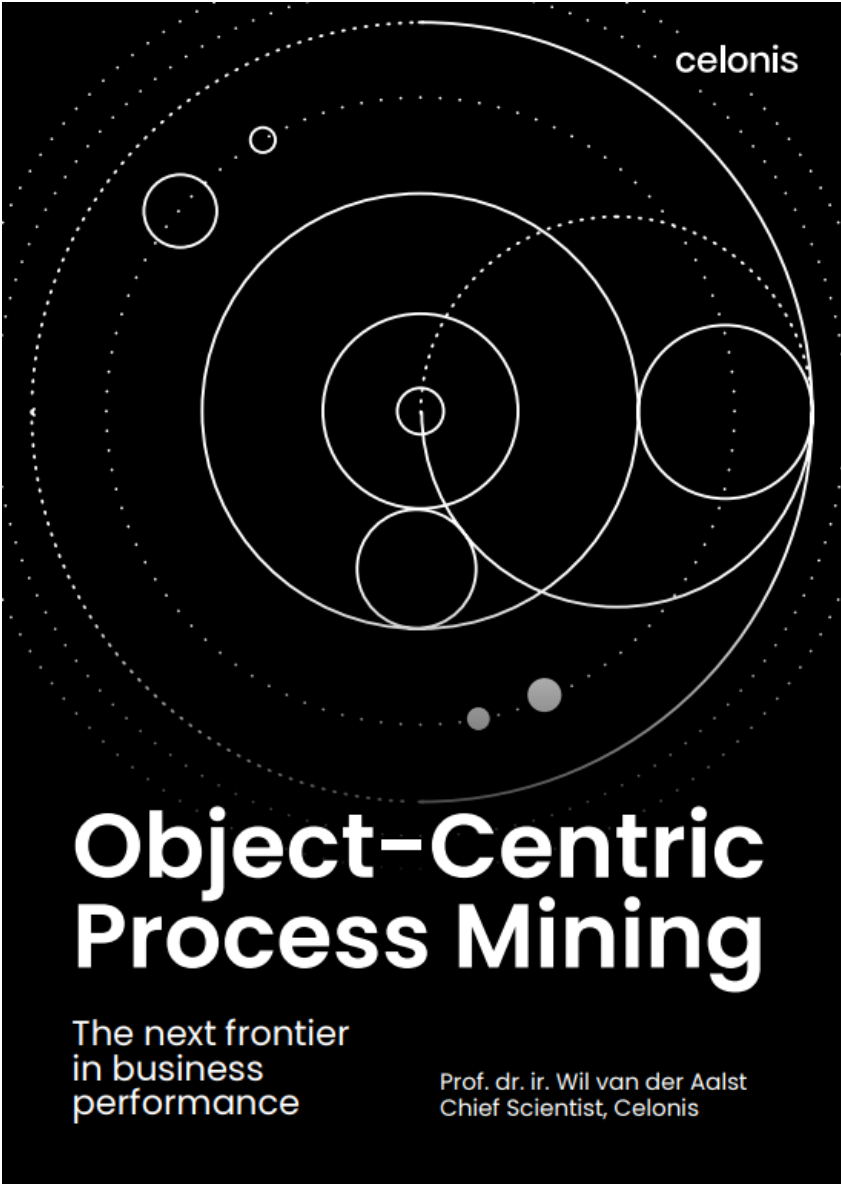
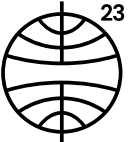


Celonis was the first to fully embrace OCPM



But we just
got started!

Learn more about OCPM?



Wil van der Aalst, Object-Centric Process Mining: Unraveling the Fabric of Real Processes. Mathematics 2023, 11, 2691. <https://doi.org/10.3390/math11122691>

celon.is/OCPM-Whitepaper